

NUTRIENT REDUCTION PROGRAM FOR THE UPPER WHITE RIVER BASIN

Physical Characteristics

The Upper White River Basin (UWRB) consists of three 8-digit hydrologic units: James River Basin, Beaver Lake Basin, and Bull Shoals Lake Basin. The basin covers a total of 2,112,474 acres and includes four reservoirs, Beaver Lake, Table Rock Lake, Lake Taneycomo, and Bull Shoals Lake in the basin and 300 miles of river. The UWRB includes 19 counties (MO - Barry, Christian, Douglas, Greene, Lawrence, Ozark, Stone, Taney, Webster, Wright, AR - Baxter, Benton, Boone, Carroll, Franklin, Madison, Marion, Newton, Washington) and two states (Arkansas and Missouri). (See Map)

Land cover types in the Watershed include Cool Season Grasses (48%), Deciduous Forest (34%), Eastern Red Cedar (9%), and Open Water (3%). Other land cover types consisted of less than one percent of the coverage including urban. (MoRAP)

Karst features are prominent in the Salem, Ozark and Springfield plateaus of the basin. The fractured limestone of the watershed allows a direct linkage making aquifers underlying the watershed extremely susceptible to contamination (USGS 1996).

Biological Characteristics

The Upper White River drains a large portion of the Ozarks ecoregion. Within the basin are numerous and diverse biological communities, representing influences from the eastern deciduous forest, Great Plains prairies, arid southwest and relicts of northern species from the Ice Age. The White River and its tributaries contain a very diverse assemblage of fish species, with 163 native species identified. On the Missouri side alone, there are 56 species or subspecies of fish that have a localized distribution in the watershed or a very limited distribution elsewhere in the state. The watershed also contains a diverse and unique array of mussels, an imperiled river organism (38 species), and crayfish. In the watershed's extensive karst regions are found largely endemic subterranean organisms also dependent on good water

quality—for example, the Ozark Cavefish, Bristly Cave Crayfish and the recently federally listed Tumbling Creek Cavesnail. There are also diverse and unique upland communities associated with xeric dolomite forests, limestone savannas and dolomite glades. The UWRB represents a rich tapestry of biological elements in a unique and interesting mix from all the adjacent biomes.

Threats and Problems

Phosphorus and nitrogen nutrients are the most common pollutants in the UWRB. Sediment is also a pollutant of concern in the basin, both in rapidly urbanizing portions of the watershed as well as areas with poor stream bank stabilization. Fecal bacteria entering recreational waters are becoming more widely recognized as a major concern as counties in the basin begin more thorough monitoring. Because the tourism industry is a primary employer in Missouri, the trend has a significant impact.

(Rural non-point sources) Grassland type farming operations and poultry operations dominate agriculture in the UWRB. Grassland farming is more prevalent on the Missouri side and poultry operations are more prevalent on the Arkansas side. Grassland pastures are continuously grazed by beef cattle resulting in poor ground cover to prevent erosion and runoff. The concern with poultry operations is the over application of phosphorus from annual spreading on the same fields. A recent NRCS funded study ranked the UWRB as 13th in the nation among all watersheds in danger of pollution from nutrient runoff.

(Urban non-point sources) Recent studies show on-site septic systems as a major contributor to nutrient and bacteria pollution. Many of the soils found in the UWRB have limitations to properly treating waste. Urbanization is evident in the watershed over the last twenty years. Population in the Basin's counties grew by 31% in the 90's. Many of the watershed's 303(d) impairments are at least partly linked to urbanization. Urbanization increases erosion, quantity of runoff due to impervious surfaces, and decreased water quality due to intensively maintained lawns. (James River WRAS) Urbanization is one reason the White River was ranked in 2002 as the fifth most endangered US river by American Rivers.

Almost all Missouri wastewater treatment plants in the basin limit phosphorus discharge to 0.5 ppm. Arkansas is initiating upgrades at their metropolitan plants to reduce phosphorus discharge to 1 ppm. However two communities on Kings River in Arkansas have no limits on phosphorus discharge and in-stream phosphorus levels downstream exceed 0.3 ppm. Scientists project that Kings River contributes 150,000 pounds of phosphorus per year to Table Rock Lake. (Arkansas Water Resources Center)

WATERSHED PLAN – WRAS INTEGRATION

Two Watershed Restoration Action Strategies (WRAS) have been developed for significant subwatersheds within the UWRB, and a third is in development. The James River Watershed in Missouri has a fully developed WRAS through the James River Basin Partnership, a local grassroots not-for-profit 501 (c) (3) organization. In Arkansas, the Beaver Watershed Partnership, a similar organization, has a WRAS in final review. A third group, the Kings River Watershed Partnership will soon develop a WRAS for the Kings River basin, a bi-state subwatershed within the Beaver Watershed. The opportunity to work cooperatively on watershed planning and management between Arkansas and Missouri is imperative, and the best time is during the initial stages of WRAS development within the subwatersheds of the UWRB. The U.S. EPA Watershed Initiative presents an excellent mechanism to move to the next level in order to develop a stronger bi-state watershed plan that expands on the WRAS for the various sub-basins.

The biological, and physical characteristics as well as economic, cultural and social makeup are similar throughout the watershed. The WRAS developed for the Beaver Watershed and the James River Basin indicate that both are listed as high priority watersheds based on the Unified Watershed Assessment. Both watersheds have been listed as having significant point source contamination from municipal effluent and nonpoint sources of contamination from: 1) applied animal manures as fertilizer to pastures, 2) on-site sewage disposal systems, and 3) urban storm water runoff. Among the priority projects designated within each WRAS to address water quality, the area most lacking information is the impact of on-site sewage disposal systems. As example, there are over 14,000 rural homes in the Beaver watershed not served by

municipal sewer. Similar or even greater densities occur throughout the UWRB. Yet, little data are available to adequately assess this impact to surface water and groundwater quality in the basin.

Considering the rapid decentralized population growth in the area, it is crucial that resources be allocated to gather the necessary data and investigate alternate on-site sewage disposal practices.

A formalized watershed plan will serve as a guidance document to foster increased cooperation and coordination between the states, and to target resources to the highest priorities within each state. This coalition is currently being coordinated through the efforts of the Upper White River Basin Foundation. Direct involvement in the development of the plan through the Bi-State White River Coalition will facilitate timely adoption and implementation of recommended action items for both states.

COMPONENTS

1. Animal Nutrient Removal – Poultry litter from operations in the basin will be pelletized and transported to retailers outside the basin for residential or commercial use. The goal is to redirect a minimum of 6,000 tons of poultry litter from Missouri and Arkansas to locations where the soils are deficient in nutrients and application will not further degrade water quality in the basin. Removal of poultry litter from the watershed will reduce runoff from fields where applications are made beyond phosphorus uptake for plant growth.

2. Upgrade Septic Tank Systems – Two targeted areas will be identified, one in Missouri and one in Arkansas, where all residences use septic tanks, and are in a sensitive geologic and/or soils setting. Project staff will recruit at least 30% of the homeowners to include tertiary treatment of effluent coming from their septic tank before being discharged into lateral lines. A minimum of 60 systems will be replaced for between 60 and 90 homeowners. Advanced treatment will reduce nutrient loads in nearby streams, and can provide the scientific data to change public policy on the use of such systems in the basin. Monies from the State Revolving funds of both states will be placed on deposit with banks participating in the loan program to achieve the lowest possible interest rates while utilizing the existing banking community to administer and service the entire loan program.

3. Public Involvement – Citizens and stakeholder groups will be recruited to participate in a bi-state process to create consensus on further public initiatives to reduce phosphorus and fecal contamination in the watershed. At least one hundred individuals representing various stakeholder groups from both states such as the poultry industry, tourism, home builders, chambers of commerce, and environmental advocates will draft an agreement on changes each group will promote with their members. Significant reduction in nutrient loading will not take place until a critical mass of stakeholder groups decide that it is in their members interest to significantly promote and encourage changes in behavior.
4. An important part of this project will be the integration of the WRAS for Beaver Lake and for the James River basins which comprise the majority of the basin.

PROJECT SCHEDULE

The Project is scheduled for 30 months beginning at the earliest possible time. For planning purposes the attached detailed schedule (attachment A) is based on a starting date of July 1, 2003 and terminating December 31, 2006 with a final public report issued by November 1, 2006

PROJECT'S ITEMIZED ESTIMATED BUDGET -See attachment B for detail budget

	Fed Funds	Local Match	TOTAL
Animal Nutrient Removal	\$ 25,000	\$109,950	\$134,950
Septic Tank Upgrade	\$301,273	\$117,531	\$418,840
Water Quality Monitoring	\$270,106	\$ 77,150	\$347,256
Water Quality Modeling Impact	\$100,000	\$	\$100,000
Administration Expenses	\$157,927	\$ 16,161	\$174,088
Public Education	\$ 30,000	\$ 20,000	\$ 50,000
Public Involvement	\$ 42,250	\$	\$ 42,250
 TOTAL	 \$926,556 73.11%	 \$340,792 26.89%	 \$1,267,348 100%

MONITORING AND EVALUATION COMPONENT

ANIMAL NUTRIENT REMOVAL – Monthly production reports and shipping documents at the plant will be reviewed to insure that production and transfer goals to remove litter from the watershed are met.

Additionally, data from existing water quality monitoring stations located in the area operated by the Arkansas Water Resources Center will be regularly reviewed to evaluate any impact.

SEPTIC TANK UPGRADE - A formal monitoring plan including a minimum of 5 monitoring stations per site tested on a bi-monthly basis for 26 months will document improvements to water quality degradation as the stream flows through the site both before and after installation of these advanced units.

MODELING - Because this is a dynamic growth area for both states, it will be important to use a nationally recognized water quality model to evaluate the full impact of these projects on the watershed as well as to project the potential benefits for various levels of future implementation.

PUBLIC INVOLVEMENT - Changes in general public conduct and attitude are difficult to gauge over the relatively short length of the grant. However a public perception survey instrument will be part of the project website, the number and source of website "hits" will be recorded and analyzed. A Bi-State Watershed Summit will be conducted and the impact of the campaign will be partially judged by the strength of the recommendations committed to by the various groups in a consensus document at the end of the Summit. Further these recommendations will be compared to a similar event to be held in March of 2003 on the Missouri side of the watershed.

RELATION TO OTHER STATE AND FEDERAL PROGRAMS

The states of Missouri and Arkansas have collaborated on water quality problems existing in the basin during a series of three annual White River Basin Forum meetings which have led to increased public awareness of the issue involved. The forums produced a bi-state memorandum of understanding (MOU) to undertake nutrient management and other projects to reduce water pollution problems in the UWRB. The directors of both state environmental agencies have confirmed that this project is consistent with the MOU.

In addition the state of Arkansas is working with the State of Oklahoma to reduce nutrient loading in the Illinois River. While the Upper White River does not include this basin, the strategies developed to remove animal nutrients from the Upper White can be replicated there to the benefit of all three states.

Additionally this project falls within the broad range of section 102 of the Clean Water Act which calls for "Comprehensive Programs for Water Pollution Control," and 104(b), which directs EPA to "develop effective and practical processes, methods, and prototype devices for the prevention, reduction and elimination of pollution."

Finally this grant complements recent enhancements to federal support under the federal EQIP program in the Farm Bill and state support for the Special Area Land Treatment (SALT) program, both of which are being consistently used in the watershed. The project is based on a holistic approach to watershed management, as are EQIP and SALT. Federal attention has been focused on a variety of Best Management Practices, but has not directly addressed the needs for better onsite wastewater treatment.

Responsible party for coordinating the proposed projects: The projects will be coordinated by staff from the Upper White River Basin Foundation, PO Box 6218, Branson, MO 65615, 417-561-1972.

Implementation of Plan: Implementation of the components of the Watershed Plan will be under the oversight of the environmental agencies of both states as appropriate: ADEQ, Arkansas Soil and Water Conservation, and the Missouri Department of Natural Resources (MDNR). Additionally other state agencies, public universities, and private watershed groups will assist in providing research and in-field assistance.

Implementation of Project: The Upper White River Basin Foundation (Primary coordinator). Although the foundation is new, the executive director, Floyd Gilzow, has 11 years of senior management experience at the state and federal level plus six years experience as the chief financial officer of the state's third largest private university.

The chief executives of the watershed groups will form a steering committee to develop a work plan and oversee the general operation of the grant. The committee will also be involved in working with local soil and water conservation districts and local health departments to identify appropriate locations for the septic tank demonstration component. The coalition represents a broad range of interest groups and technical expertise through its staff and active board members. Implementing this grant will continue the pattern of meaningful cooperation that has characterized watershed partnerships in the past.

The watershed groups include:

Watershed Committee of the Ozarks: Formed in 1984 this group has administered 15 federal and state drinking water source protection grants including cost share provisions with urban and agriculture landowners. The Executive Director is Loring Bullard who has worked on watershed issues in the basin for 14 years.

James River Basin Partnership: Formed in 1995, this organization has consistently demonstrated successes with in-the-field projects. They have administered three federal grants including the 319 grant that assisted in creating the organization. Its current chairman is the Presiding Commissioner of the basin's largest population center. Its director, Diana Sheridan, has held her current position for 2 years.

Table Rock Lake Water Quality, Inc: Formed in 2000, this organization is implementing its second grant with a sharp focus on eliminating the pathway of exposure between area septic tanks and the Lake. The director, David Casaletto, helped form the organization.

Kings River Watershed Partnership: This is a brand new organization and this will be an opportunity for leadership development and mentoring.

Beaver Lake Watershed Partnership: Organized in 1999 this group has focused on community educational outreach. The Director, Anne Miners, was a resort owner for 17 years followed by 8 years on the County Quorum Court. She is a founder and board member of the Arkansas Watershed Advisory Group.

Leatherwood Creek Watershed: This is one of the local projects of the National Water Center located in Eureka Springs, AR which has been in operation for over a decade.

Additionally the groups enjoy extremely close working relationships with the environmental agencies in both states as they assist in developing initiatives that meet public policy goals.

Sources of Technical Expertise: Water Quality Data field work in Arkansas is under the control of the Water Resources Center of the University of Arkansas which conducts ongoing water quality monitoring for the Arkansas Soil and Water Conservation Commission and ADEQ. In Missouri, similar work will be conducted by Dr. Robert Pavlowski, Associate Professor of Physical Geography at Southwest Missouri State University who has conducted water quality research projects including federal grants in conjunction with the James River (MO) Basin Partnership. Modeling of the data for public policy use will be conducted through an agreement with the United States Geological Service. Additionally Mr. Michael Ferguson, President of Agri-Recycle, will provide ongoing oversight and general management of the operation of the poultry litter processing plant. Mr. Ferguson helped develop and oversaw construction of the largest poultry litter processing plant in the United States in conjunction with Purdue Farms.

Additional indirect stakeholders: Mo Dept. of Natural Resources, Ark. Dept. of Environmental Quality, MO and AR - National Resources Conservation Service, University of Arkansas (Water Resources Center), University of Missouri (FAPRI), Southwest Missouri State University, MO - Department of Health, Arkansas Soil and Water Conservation Commission, Missouri Soil and Water Conservation Commission, National Poultry Federation, Home Builders Association, Northwest Arkansas Council, U.S. Army Corps of Engineers, Septic Tanks & Systems - Contractors & Dealers, Missouri Farm Bureau, Arkansas Cattlemen's Assoc., Association Builders & Contractors of Arkansas, Arkansas Farm Bureau Federation, Arkansas Home Builders Assoc., Arkansas Pork Producers Association, Arkansas Realtors Association, Arkansas Rural Water Association, Arkansas Clean Water Commission, Arkansas Conservation Commission, and Missouri Agricultural & Small Business Development Authority

Description of Outreach Activities

Within Arkansas and Missouri: The project will implement a unique Website to provide information on this project as well as the other EPA selected watersheds as well as allowing residents to sign up for periodic updates and copies of final reports. Additionally the project will conduct individual editorial board meetings with the seven daily newspapers with a presence in the watershed to solicit ongoing support. The coalition will utilize free and paid radio media to highlight issues raised in the projects. Media events, such as field days when advanced septic systems are installed, will be heavily promoted with local media by all seven watershed groups. Project staff will be present at all statewide water quality conferences in either state to present information on the grant plus all data gathered to date. Finally the recommendations of the Bi-State Summit will be published and provided to chief environmental officers in all the states in the Midwest Region as well as senior EPA administrators.

Within target areas for septic tank upgrade, the project will utilize a broad range of outreach including direct contact, local media, direct mail, telemarketing and community meetings to communicate the existence and benefit of this cost share program to residents in and around the effected area.

The summit will have its own public relations component to solicit public support for the event as well as share the results with the legislatures of both states, county officials, congressional delegations and interested citizens.

Other Areas: The EPA reports that 80 million residents, or 28% of the US population, are not served by municipal sewage systems. Most of those individuals utilize septic systems. In many parts of our country these systems do not protect surface and groundwater supplies any better than they do in the Ozarks. The project will work with the EPA's Small Flows Center to distribute materials and data from our demonstration project. Additionally, all the other strategies used for the bi-state area will be available to distribute information to residents of the basin.